



AIMS

African Institute for
Mathematical Sciences

NEXT EINSTEIN INITIATIVE

Developing Africa's capacity in mathematical sciences: The Journey of AIMS

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Worcester Polytechnic Institute, USA

Outline

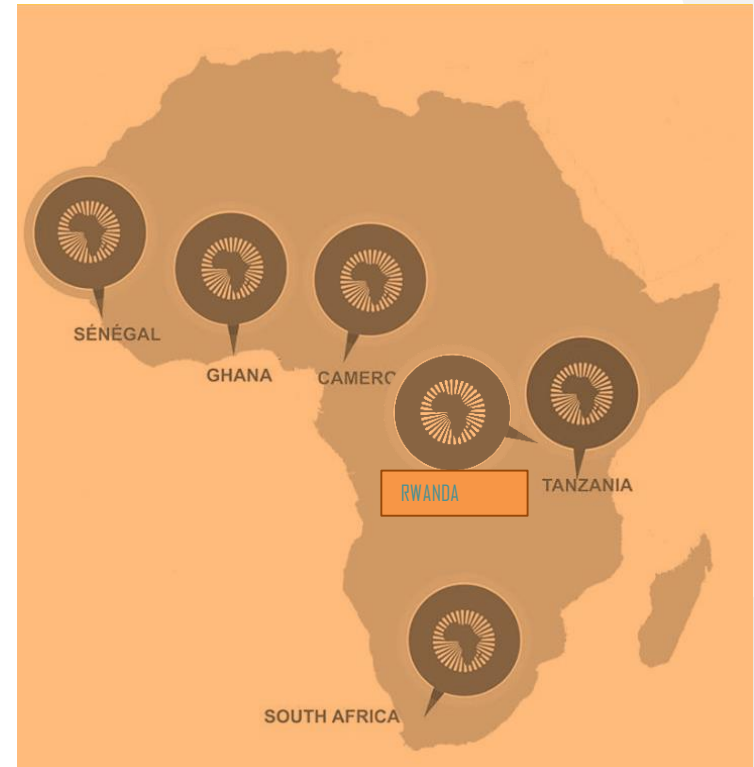
- Why AIMS?
 - Context
 - About AIMS
 - AIMS' Theory of Change
 - AIMS and Gender Equality
- The AIMS Model
 - AIMS Structured Master's Programme in Mathematical Sciences
 - AIMS Research
 - What drives the success of our Research Collaborations
- Outputs
- Limitations and Recommendations
- Acknowledgement

Context

- Centres for the advancement of STEM have steadily increased in Africa leading to the emergence of initiatives such as the World Bank Centres of Excellence etc.
- Such Centres are contributing to the increase of the number and the quality and of research outputs in Africa
- However, pan African networks of STEM Centres, such as the African Institute for Mathematical Sciences (**AIMS**) are still limited
- Such networks have a high potential to produce rapid turnovers on investments in STEM.

About AIMS

- The ***African Institute for Mathematical Sciences (AIMS)*** is a pan-African network of (six) centres of excellence for postgraduate training, research and outreach in mathematical sciences.
- Founded in 2003, the 6th AIMS centre opened in August 2016.
- The ***AIMS Next Einstein Initiative (AIMS-NEI)*** is an effort to build a network of 15 centres by 2023 in Africa.
- *AIMS recruits Africa's talented university graduates to provide them with a Master's level program in mathematical sciences*



AIMS' Theory of Change

It starts with the belief that significant investment in mathematical sciences in Africa will put the continent on the fast track to technological catch-up and socio-economic development.

- ◆ Innovation to facilitate the growth of mathematical sciences is as an important tool for African development.



AIMS and Gender Equality

"The Need for Equal Participation"

- Women have an equal role to play in advancing development on the continent.
- Over the last 10 years, 30% of AIMS students were women
- All female students meet the same requirements as male colleagues – breaking down stereotype that mathematics is a male only field
- Goal is to move from 30% to 50% in the next 5-10 years



Activities at AIMS centres



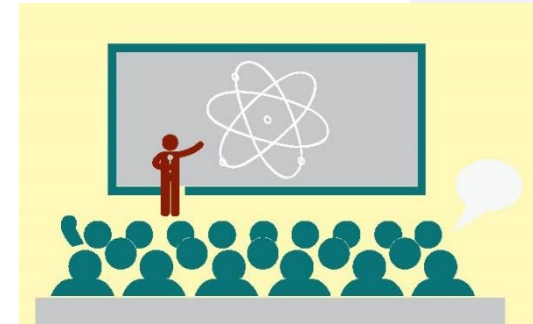
TRAINING

AIMS provides a structured Master's program that is enabling a critical mass of African academics, researchers and entrepreneurs on the cutting-edge of STEM



RESEARCH

AIMS is facilitating research in Africa, by Africans as well as international exchanges opportunities through workshops.



PUBLIC ENGAGEMENT

Build the pipeline , popularize mathematics, improve perceptions regarding the mathematical sciences and their value as a socio-economic development option

AIMS as a learning environment⁺

An AIMS center provides a holistic learning environment:

- Around-the-clock availability of resources such as IT equipment, library and study space makes learning a constant option.
- World-class teachers, researchers and tutors to enhance students' academic experiences
- Basic needs, such as accommodation, commutes and meals, are fully catered for by AIMS, allowing students to focus on their academic pursuits.





Two streams:

- ◆ Core Master's Program
- ◆ Co-op Master's Program

AIMS Taught Master's Program

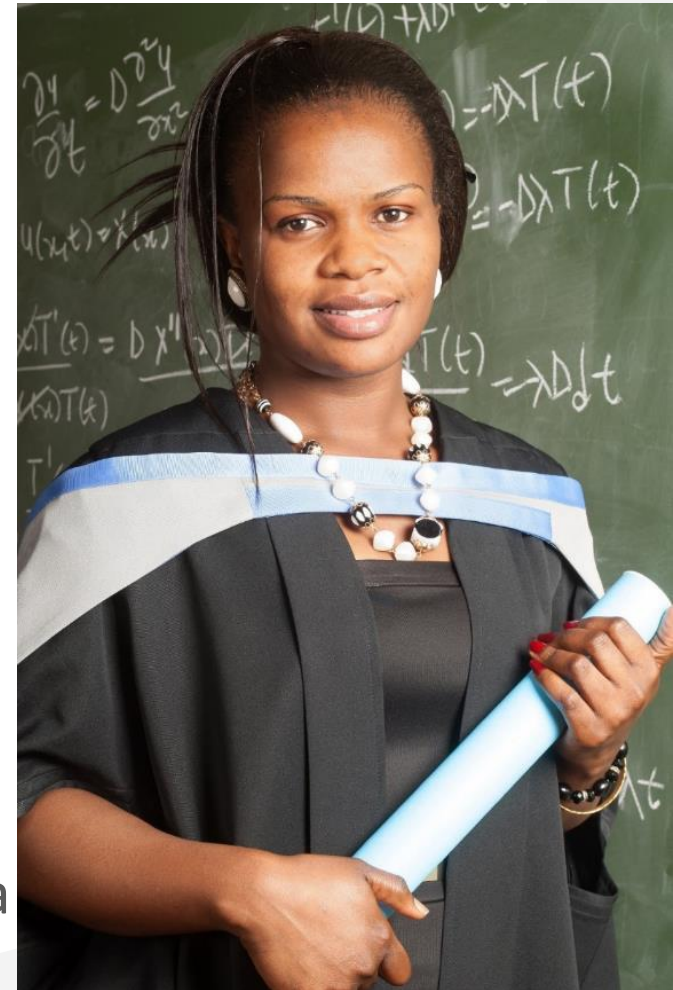


AIMS Co-op Master's Program



Co-operative Education stream

- ◆ The Co-operative Education (Co-op) stream of AIMS Master's programme enables students to apply their scientific knowledge to real world problems while gaining work experience in an industrial environment.
- ◆ The 1st cohort of Co-op Master's students graduated three months ago (with specializations in Big Data & Computer Security)
- ◆ Already, nine out of the eleven students who received Master's degree with got a job offer.



The AIMS Industry Initiative

Through this initiative, AIMS bridge into private sector work in ICT, health and finance

Jobs and internships for
students and Alumni

Involvement in
curriculum
development &
delivery



Co-operative
Master's in
Mathematical
Sciences

Business &
entrepreneurship
& skills training

Industrial
Research

AIMS Research

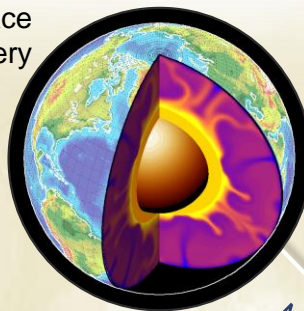
"To speed up knowledge generation and innovation"

Mathematics:
Topics from Geometry,
Algebra and Analysis
Backbone of Applied
Mathematics or pure and
applied sciences

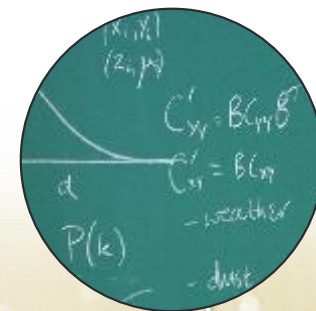
**Computational mathematics,
Cryptography** Applications:
Data Security, Big Data



**Geomatics and
Hydro-geomatics**
Applications: Oil
reservoirs,
subsurface
energy recovery



Cosmology and Astrophysics
Applications: Square Kilometre
Array (SKA) Machine Learning



PURE/ABSTRACT MATHS

SPACE AND THE UNIVERSE

NATURAL RESOURCES

ICT

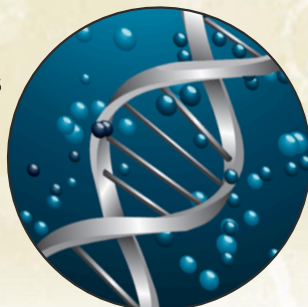
BUSINESS & GOVERNMENT

HEALTH

Financial mathematics
Applications Pricing,
stock markets
**Mathematical
Foundations and
Scientific Computing**
Applications:
E-governance

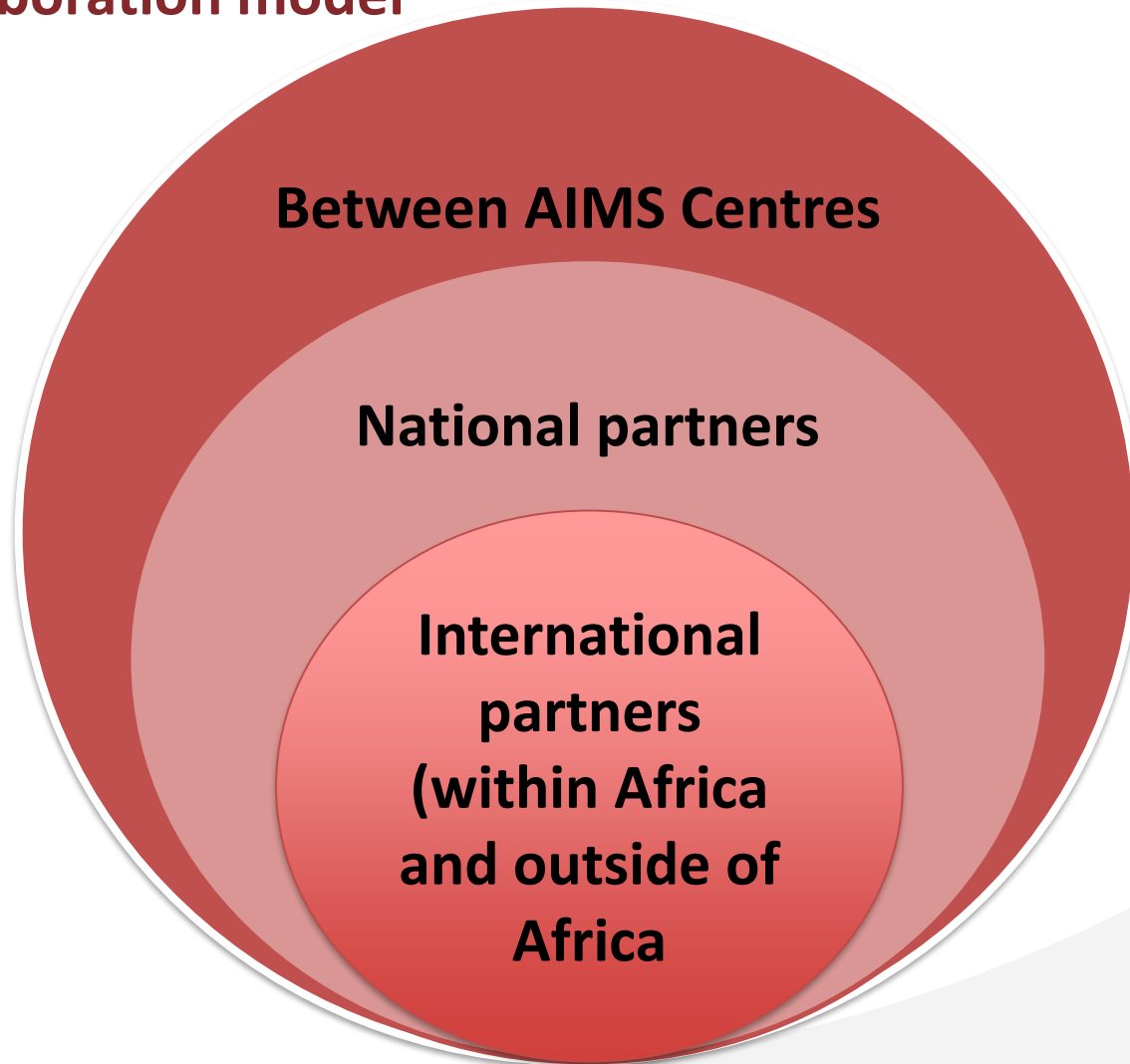


**Biomathematics, Mathematics
and Physical Biosciences**
Applications: Maternal and child
health, Infectious diseases
(Ebola, HIV, Malaria)



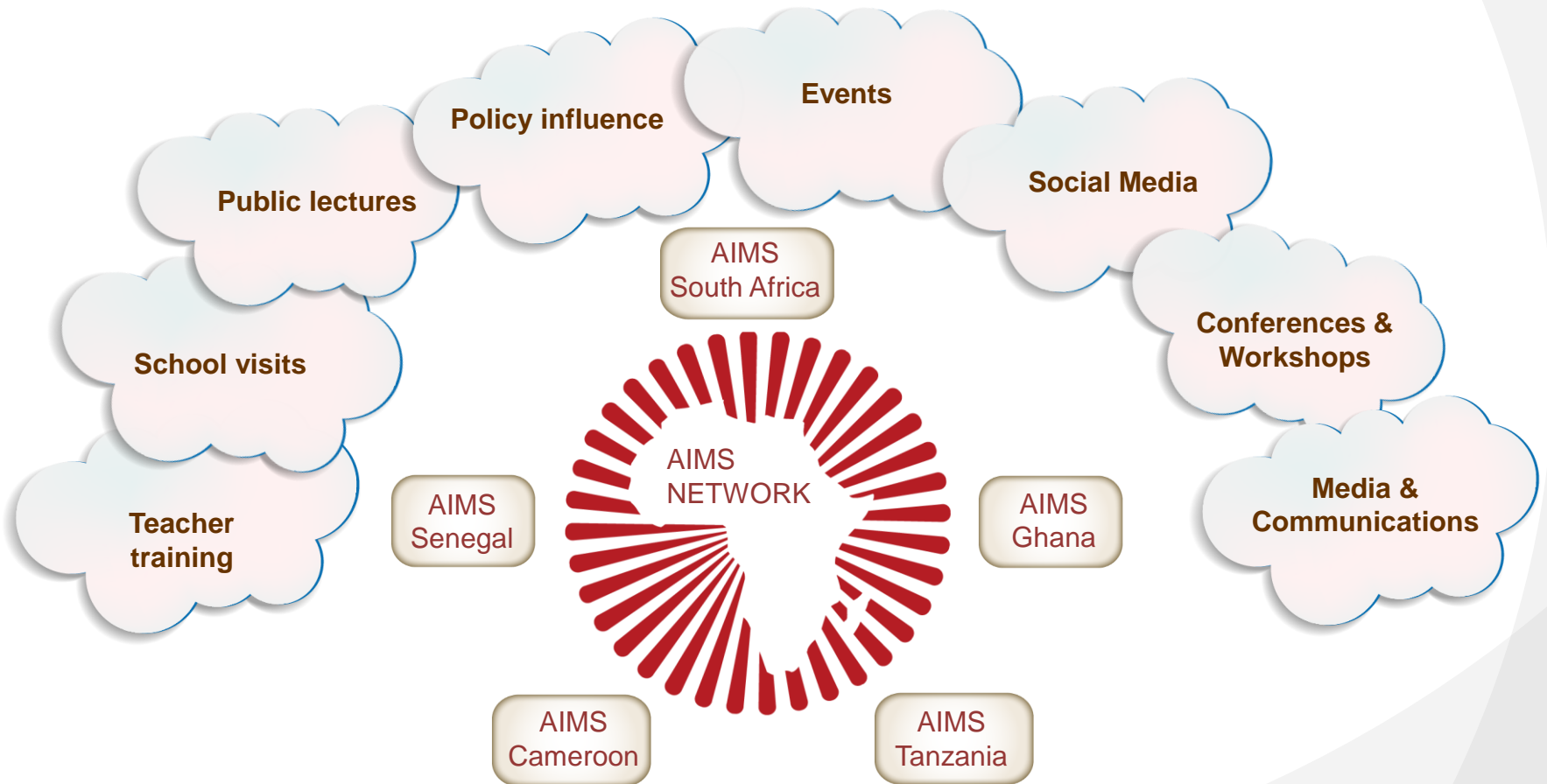
**MATHEMATICAL
SCIENCES**

- **AIMS collaboration model**



Public Engagement

"To communicate research-based information, advocate, and reward talent"



Outputs

- The year 2016 saw the graduation of AIMS's 1000th student across the network, with 32% of them women from 42 African countries.
- At least 50% of AIMS graduates remain in Africa
- At least 50% of graduates specialize as researchers within the mathematical sciences hence contributing to global research output in Africa and beyond.
- Links between the AIMS researchers / students and renowned Increases the pipeline of talented emerging scientists on the African continent and research outputs from Africa

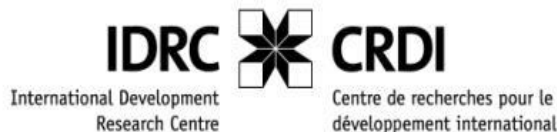
Limitations

- Dependency to donors and governments financial supports.
- Promoting Women in Science, and gender equality in the staffing is a key objective to AIMS. But gender ratios seem very difficult to reach.
- A snapshot of AIMS collaborators indicates that inter-African collaboration still lacks behind

Recommendations

- The model will only be sustainable through securing additional funding sources in the long term.
- Links with industry is key to sustainability as they also can become funders
- Government could provide more funding to promote inter-African research collaboration and STEM among young women.

Current Supporters



Will the Next Einstein Be a Woman from Cameroon?

By MAKERS Team | March 13, 2015



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SHARE ON TWITTER 

EMAIL TO A FRIEND 

This year's Pi Day is particularly special because not only is it 3.14, but it's 3.1415. This only happens once every century! We say that's all the more reason to celebrate brilliant female mathematicians that are contributing solutions to global challenges.

Around the world, women only represent **30% of researchers**, but these four women are making a name for themselves and encouraging more girls to get involved in science, technology, engineering, and math (STEM fields), particularly in Africa. They all participated in a program called AIMS—the African Institute for Mathematical Sciences—that recruits students from across the continent to participate in a postgrad program taught by international

AIMS: www.nexteinstein.org

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NEF: www.nef.org

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